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XXII.—On some new carboniferous limestone fossils

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periments upon the influence of pressure, heat and electricity; of sulphuric, nitric, muriatic and hydrosulphuric acids; potash, ammonia, alcohol, æther, turpentine, common salt, Owen's liquid, milk, fresh water. With very dilute sulphuric acid, the excitation is strongly marked, attended with a rupture more or less rapid of the filaments uniting the interior mass to the envelope, and finally a detachment of the mass from the envelope, and a withdrawal towards its mouth. A portion of the inner mass and tissues may still cover the inner surface of the envelope; but after a while they come away from the envelope, and collect about the mouth, leaving the envelope empty. In the dark there is a very brilliant light at the first contact of the dilute acid with the *Noctilucæ*; then afterwards there appears a clear fixed white light on one part, which rapidly spreads, till the whole is like a ball of silver. The brilliancy soon after begins to diminish, and rather rapidly disappears. The rupture of the fibres and disorganization of the interior mass evidently take place consentaneously with the flashes and change in the light.

It is hardly necessary to cite the other experiments in this place. M. de Quatrefages concludes that the light is produced by the contraction of the interior mass of the body; that the scintillations are owing to the rupture and rapid contraction of the filaments of the interior, and that the fixed light which these animals emit before dying, proceeds from the permanent contraction of the contractile tissues adhering to the inner surface of the general envelope. The production of the light is independent of all material secretions. Whether it is accompanied by a discharge of electricity or not remains to be ascertained.

XXII.—*On some new Carboniferous Limestone Fossils.* By FREDERICK M'COY, F.G.S., Hon. F.C.P.S., Professor of Mineralogy and Geology in the Queen's University of Ireland.

Pinna spatula (M'Coy).

Desc. Valves very narrow and much elongated, about four times larger than the width of posterior end, very slightly convex except at the beaks, which are pointed and almost cylindrical, the sides gradually flattening as they approach the posterior end, which is subtruncate or slightly rounded obliquely; cardinal margin slightly thickened, with the cartilage ridge very close within its edge; surface perfectly smooth, or with very faint laminar lines of growth parallel with the margins. Length of large, rather imperfect specimen $5\frac{1}{2}$ inches, proportional greatest width at posterior end about $\frac{30}{100}$, greatest depth $\frac{8}{100}$ or $\frac{9}{100}$.

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Fragments of this species might be taken for a *Solen*, and the *S. siliquoides* (Kon.) may have some affinity with it, though specifically distinct. The muscular impression is rather large, though superficial, quadrato-reniform, rather behind the middle of the length, and nearer to the cardinal than the ventral margin.

Specimens of the above large size, rare in the carboniferous limestone of Derbyshire; specimens about 3 inches long, and slightly more convex, in the carboniferous limestone of Lowick, Northumberland.

(*Col.* University of Cambridge.)

Cardiomorpha orbicularis (M'Coy).

Desc. Suborbicular; anterior end moderately large, semicircular, compressed; ventral and posterior margin very convex, regularly curved; posterior side small, rounded, gradually compressed; beaks very large, tumid, obliquely inrolled towards the anterior end, projecting greatly beyond the hinge, nearly over which is the deepest part of the shell; valves becoming gradually flattened towards the margins; surface smooth, even; substance of the shell very thin; hinge-margin inflected at right angles, forming a cartilage support rather less than 2 lines wide. Length 3 inches 2 lines, proportional width from beak to ventral margin $\frac{90}{100}$, length of anterior end $\frac{18}{100}$, width half-way between the beak and posterior end $\frac{65}{100}$, depth (greatest near the beak) $\frac{33}{100}$.

This is only likely to be confounded with the *C. oblonga* (Sow. sp.), but is distinguished by its large anterior and small posterior sides, extremely large beaks, and flattened orbicular valves. The *young* of the *C. corrugata* (M'Coy), which is nearly like in form, is distinguished by the large corrugations of the sides.

Seems not uncommon in the carboniferous limestone of Derbyshire.

(*Col.* University of Cambridge.)

Lithodomus Jenkinsoni (M'Coy).

Desc. Longitudinally oblong or oval, subcylindrical; beaks small, much incurved, obliquely inrolled over the wide, deep, cordate, anterior lunette; anterior end very short, extending very slightly in front of the beaks, obtusely rounded; posterior end slightly wider than the anterior, obtusely rounded; dorsal margin nearly straight, gradually rounding into the posterior end; ventral margin very slightly convex; valves evenly tumid, most so along an undefined line from the beaks to the respiratory margin a little in front of the middle of the length; surface with irregular, coarse, concentric lines and

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plicæ of growth. Casts show the large anterior and posterior adductor impressions distinctly connected by the simple pallial scar, together with faint traces of the concentric plicæ of the surface, crossed by microscopic, close, diagonal striæ from the beaks towards the respiratory margin; also an impression of the small cartilage ridge within the dorsal margin. Length 1 inch 7 lines, proportional depth greatest at middle of length $\frac{45}{100}$, depth at posterior end $\frac{40}{100}$, from apex of beaks to ventral margin $\frac{20}{100}$, length and width of anterior lunette $\frac{12}{100}$, greatest depth of both valves $\frac{42}{100}$, length of anterior end $\frac{10}{100}$.

This is a smaller and much more obtuse species than the *L. dactyloides* (M'Coy), the anterior end being proportionally broader and more obtusely rounded; the posterior end is also less pointed, and the anal angle not elevated. I have not seen the external shell of this species, except near the margins, and here there is no trace of the distinct longitudinal or radiating striation of that species, traces of which are however seen on the internal casts. I dedicate this species to the Rev. Mr. Jenkinson of Lowick, to whose labours we owe the most extensive and beautifully perfect local collection perhaps ever made—particularly instructive by the frequent exhibition of internal characters.

Not uncommon in the impure carboniferous limestone of Lowick, Northumberland.

(*Col.* University of Cambridge.)

Edmondia rudis (M'Coy).

Desc. Rotundato-quadrate, very gibbous; beaks very large, obtuse, posterior end broad, subtruncate, very slightly oblique; posterior slope flattened, steep, undefined; anterior end subtruncate, abruptly compressed; ventral margin gently convex; hinge-line nearly as long as the shell, slightly raised, middle of the shell with very unequal rugged plicæ, parallel with the ventral margin, anterior and posterior slopes evenly smooth. Length 1 inch 1 line, proportional width $\frac{85}{100}$, width of posterior end $\frac{80}{100}$, length of anterior end $\frac{15}{100}$, depth of one valve $\frac{26}{100}$.

The short, quadrate, extremely gibbous form and unequal rugged plicæ distinguish this species from all other carboniferous fossils that I know at a glance. There is often a sort of large obscure pitting between the plicæ. The cardinal cartilage ridge is very thick, and nearly as long as the hinge-line or simple erect cardinal margin.

Rare in the impure carboniferous limestone of Lowick, Northumberland.

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Murchisonia dispar (M'Coy).

Desc. Elongate, very acutely conic; apical angle 30°; spire of about eight very gradually increasing tumid whorls having a very thick obtuse prominent band, forming a rounded keel much nearer the lower than the upper suture; upper and lower surfaces slightly tumid, convex, the lower portion most steeply sloped; the band is either simple, or rarely with three spiral striæ; two strong spiral lines below the keel, and six slightly smaller ones above it on each whorl; base of body-whorl rounded, convex, with an obtuse angulation at such a distance below the keel, that it is just concealed by the suture on the spiral whorls; lines of growth five, unequal, obscure, slightly arched, oblique to the band. Length 7 lines, proportional width $\frac{50}{100}$, height of last whorl $\frac{45}{100}$, height of penultimate whorl $\frac{20}{100}$.

This species is easily distinguished from its allies, the *M. subsulcata* and *M. Archiacana*, De Koninck, and *M. Larconi*, M'Coy, by the disparity in width of the parts of the whorls above and below the band, and the disparity in number of the keels or spiral striæ which ornament those parts.

Not very uncommon in the impure carboniferous limestone of Lowick, Northumberland.

(*Col.* University of Cambridge.)

Pleurotomaria decipiens (M'Coy).

Desc. Var. α. Spire acute, regularly conic; apical angle about 40°; composed of about seven or eight gradually increasing flat whorls; suture a simple impressed line; base of body-whorl flattened, forming a strong angle with the spire; no umbilicus; pillar-lip slightly thickened, arched; mouth oblong angulated, a little wider than long; surface marked with narrow thread-like spiral ridges, separated by flat or slightly concave spaces about three times their width; about eight or nine spiral ridges on each whorl, and seven or eight more rather stronger on the base, the intervening spaces very irregularly cancellated by obscure, unequal, obtuse, longitudinal wrinkles, very slightly oblique to the band, forming an obscure irregular, quadrate pitting, occasionally visible on the cast, these transverse plicæ closer and more oblique on the base; band about the width of the ordinary spaces between the spiral lines, flat, very inconspicuous, and bounded by very delicate, impressed lines, destitute of the obtuse cancellating plicæ of the rest of the surface, situated two inter-spiral spaces above the lower suture of each whorl. Width 10 lines, proportional

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height of last whorl $\frac{65}{100}$, height of penultimate whorl $\frac{40}{100}$, width of mouth $\frac{70}{100}$.

Var. β. Very elongate conic; apical angle about 40°; whorls moderately convex; base of basal whorl gradually prolonged, not flattened nor separated by an angulation from the sides; mouth a little longer than wide. Length of last whorl 11 lines, proportional width $\frac{95}{100}$, height of penultimate whorl $\frac{40}{100}$.

It will be seen that this species has two extreme varieties somewhat resembling those of the *P. yvanni*; the variety α so exactly resembles a *Trochus*, that it requires the most careful examination to detect the extremely obscure, though definite band, to convince the observer that it is a *Pleurotomaria*; the *var.* β, with the basal whorl elongate and rounded in front or at base, like the corresponding variety of *P. yvanni*, is so like a *Macrochilus*, that it is only by carefully tracing the intermediate forms and detecting the very obscure band, noting the same number of spiral ridges on the whorls, &c. that I have become satisfied of their identity; both varieties have usually only four whorls preserved, the posterior end of the animal at that length depositing convex imperforate diaphragms, and becoming naturally decollated.

Both varieties rare in the impure lower limestone of Lowick, Northumberland; the *var.* β rare in the similar limestone of Kendal.

Pleurotomaria erosa (M'Coy).

Desc. Orbicular, depressed, very obtusely conical; apical angle 105°; spire of $4\frac{1}{2}$ rapidly enlarging whorls; flattened or very slightly convex; sutures fine, simple impressed lines; body-whorl flattened or slightly convex in the upper two-thirds, the periphery very obtusely rounded, close to the broad flattened gently convex base; umbilicus entirely closed, with a large, very thick, semicircular shelly pad; broad, narrow, obscure, bounded by two fine impressed lines; surface glossy, eroded with deep, obtuse, excavated markings without regularity in size, shape or direction; lines of growth arching backwards to the band, scarcely visible. Diameter 5 lines, proportional height $\frac{75}{100}$, height of mouth $\frac{60}{100}$, space between last and penultimate sutures $\frac{20}{100}$, width of umbilical pad $\frac{45}{100}$.

The band of this species is often almost invisible on the periphery of the body-whorl, and the lines of growth can only be traced here and there with a lens. The substance of the shell is very thick, and with the glossy surface, general form, and large umbilical pad recalls *Rotella* (*Pithonellus*) very strongly.

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The peculiar "worm-eaten" appearance of the irregular pitting of the surface is equally marked in the two specimens before me.

Rare in the carboniferous limestone of Lowick.

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Macrochilus linnæiformis (M'Coy).

Desc. Elongate fusiform, very acutely rhomboidal, greatest width at about the middle of the total length, from whence the anterior or basal part is conoidally attenuated or rapidly sloped to the greatly narrowed front of columella, and very rapidly sloped to the suture, which is simple and slightly imbricating; spire very abruptly attenuated, long, very slender; sides very concave in the profile of about six or seven whorls (usually five preserved); apical angle 54°; surface polished very smooth, with occasionally fine traces of obsolete direct lines of growth; mouth narrow, elongate, contracted before and behind; anterior part of columella very slightly thickened. Length about 1 inch 7 lines, proportional length of mouth of body-whorl $\frac{70}{100}$, width of body-whorl $\frac{57}{100}$, width of penultimate whorl $\frac{30}{100}$, space between last and penultimate sutures $\frac{13}{100}$, width of mouth $\frac{30}{100}$.

This beautiful species is so totally distinct in form from any of those described that it is unnecessary to compare them. The very abrupt attenuation of the elongate spire gives so much the outline commonly seen in *Linnæa* as to suggest the specific name: in addition to this remarkable peculiarity, the species differs from its congeners in the conoidal attenuation of the produced front, from the line of greatest width of body-whorl, which is at about one-third its length below the suture.

Not very uncommon in the carboniferous limestone of Lowick, Northumberland.

(*Col.* University of Cambridge.)

Macrochilus brevispiratus (M'Coy).

Desc. Elliptical, moderately gibbous, most so about the middle of the length; spire about one-fourth of the total length, pointed; of four whorls gently convex in the middle; sutures slightly imbricating; apical angle varying from 82° to 100°; anterior portion or base produced, moderately convex; surface smooth, with very faint fine striæ of growth visible near the mouth, being scarcely sinuous and very slightly oblique; mouth elongate ovate, indented by the posterior part of the body-whorl; anterior half of columella thickened, arched. Length of rather small specimen 9 lines, proportional length of mouth or last

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whorl $\frac{85}{100}$, width of body-whorl $\frac{66}{100}$, width of mouth $\frac{45}{100}$, space between last and penultimate sutures $\frac{15}{100}$.

The extreme shortness of the spire separates this form from all of the genus at once, except the *M. Michotianus* (D'Kon.); from that globose species, it is distinguished by its much more elongate slender form (indicated by the much less proportional width of the body-whorl when compared with the total length), fewer spiral whorls, less convexity, and the whorls sloping gradually to the sutures.

Rare both in the lower carboniferous limestone of Derbyshire, and in the carboniferous limestone of Lowick, Northumberland.

(*Col.* University of Cambridge.)

Straparollus costellatus (M'Coy).

Desc. Discoidal, depressed, very obtusely conic; spire of rather more than six very gradually increasing whorls, each slightly convex above, strongly indenting the suture, which is an impressed sharp line; apical angle 110° (from the obtuseness of the apex its angles would be larger in very young specimens); umbilicus very wide, rounded, half exposing all the whorls; base of body-whorl very convex, rounded, with a very obscure angulation at the edge of the umbilicus; periphery narrowed, obtusely rounded; upper surface of the whorls marked with sharp, slightly sigmoid, rather unequal ridges, arched obliquely backwards, becoming abruptly very much finer and more numerous on passing the circumference to the base (ten of the upper ridges in two lines on the body-whorl), each separated by a sulcus about its own width from the next. Diameter 10 lines, proportional height of spire $\frac{40}{100}$, height of last whorl $\frac{36}{100}$, distance between last and penultimate suture $\frac{15}{100}$, width of umbilicus $\frac{60}{100}$, width of mouth $\frac{40}{100}$.

This species is distinguished from its congeners by the beautifully sharp costellation, or transverse sculpturing of the whorls of the spire, which abruptly cease on the base of the body-whorl, or become there confounded with the lines of growth. The inner lip is complete, but thin, as in other species of *Straparollus*, distinguishing them from *Platyschisma*.

Rare in the lower carboniferous limestone of Lowick, Northumberland.

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Nautilus? *costato-coronatus* (M'Coy).

I give this provisional name to a fragment too imperfect to allow of full description, but so strongly marked, and unlike all

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described types, that I wish to call attention to it. The fragment is 7 inches long, and is divided into seven equal chambers, with simple edges; the surface exposed is the periphery, which is broadly rounded, moderately and evenly convex, the sides divided into large conoidal tubercles, each tubercle on one side coincide with one chamber, and there are two chambers between each pair of tubercles, the width of the periphery in our specimen is 6 lines, and it is marked with ten narrow equal card-like, closely tuberculated ridges separated by slightly wider flat spaces.

It strongly resembles the *N. tuberculatus*, Sow., but is distinguished by the costellation of the surface.

Very rare in the carboniferous limestone of Lowick.

(*Col.* University of Cambridge.)

Nautilus tuberosus (M'Coy).

Desc. Discoid, greatest width of the whorls at the angle bounding the periphery, which latter is very wide, moderately concave in the middle, and having the angle on each side undulated into large obtuse tubercles (about $1\frac{1}{2}$ inch from tip to tip on last whorl); sides sloping rapidly with slight convexity to the umbilicus; mouth subquadrate, angles rounded, inner side smaller than the other three. Diameter 7 inches 9 lines, width of last whorl 2 inches 2 lines, width of periphery 2 inches 10 lines, at inner edge 1 inch 10 lines, diameter of umbilicus about $3\frac{1}{2}$ inches.

I have not distinctly seen the surface of this very large species, but it seems to be smooth. The comparative flatness and width of the sides, more quadrate mouth, and deeply concave periphery, easily distinguish it from the *N. tuberculatus* (Sow.), which is the only allied form. In the figure in the 'Mineral Conchology' of *N. tuberculatus* (t. 249) there is an apparent concavity of the section of the periphery, but as this did not agree with the inner outline I doubted its correctness, and on writing to Mr. Sowerby he very kindly furnished me with the exact form of the section of the original specimen, proving that the periphery is strongly and regularly round, contrasting in the strongest manner with the present species, which also wants the medial line of the *N. tuberculatus*. I have only indistinctly seen the septa, which seem to be regular, moderately arched, and rather close. The position of the siphon unknown.

Very rare in the carboniferous limestone of Derbyshire.

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Orthoceras (*Cycloceras*) *Flemingi* (M'Coy).

Desc. Very gradually tapering; section (? broad oval), siphon subcentral large, slightly excentric; septa numerous, moderately convex, one coinciding with each of the external rings. Surface girt with close, obtuse, prominent, transverse rings, little more than their own diameter apart, undulated by about fourteen or fifteen strong longitudinal costæ, slightly further apart than the transverse rings, so that the oblong intervening spaces are wider than long, and nearly equalling them in thickness, both transverse rings and intervening spaces marked by strong transverse imbricating striæ, six or seven between the centre of one transverse ring and the next. A specimen 5 lines long and 2 lines in diameter at the smaller end has twelve rings.

This species can only be confounded with the *O.* (*C.*) *rugosum* of Flem., from which it is distinguished by its much more numerous and closer rings, fewer and larger longitudinal costæ, stronger transverse striæ, and large siphon far removed from the margin.

Very rare in the carboniferous limestone of Lowick, Northumberland.

(*Col.* University of Cambridge.)

Orthoceras (? *Poterioceras*) *cornu-vaccinum* (M'Coy).

Desc. Conical, rapidly tapering to an obtusely rounded point, very slightly arched; section perfectly circular throughout; septa very oblique, flattened, slightly convex, moderately approximate, extending much further forward on the inner side of the general curve than on the outer or convex aspect, the lateral edges being very slightly sigmoidal, on account of their obliquity; the septa are broad oval in form, the *longest diameter being in the antero-posterior direction*; siphon large, about its own diameter within the outer edge (corresponding with the convexity of the general curve of the shell). Surface horny in appearance, marked with irregular scratch-like longitudinal markings, and fine, nearly regular transverse impressed lines, separated by rather wider flattened spaces; thirteen transverse striæ in 2 lines at an inch and a quarter in diameter, about twenty in the same space at 9 lines in diameter. Length of average specimen 5 inches 9 lines, 2 inches 3 lines in diameter at the anterior end, and regularly tapering to the obtusely pointed apex in the above length; average distance of the last few septa 2 lines.

The above measurements are of average-sized specimens,

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although examples occasionally occur a couple of inches long. The general, slightly curved, obtusely pointed, rapidly tapering form, and peculiar horny looking texture have suggested the specific name. The only described fossil it has any resemblance to is the *Cyrtoceras Verneuilanum* of De Koninck (A. F. B. t. 48. f. 6), but it is easily distinguished by that species having a broad oval transverse section, while the section of the present fossil is perfectly circular; and the septa which from their obliquity appear oval, have their long axis directed in the opposite direction; the curvature is also less in our fossil. Some of the specimens show a very slight contraction at the mouth, which renders it probable that the species belongs to the subgenus *Poterioceras*, with which all the other characters agree exactly and better than with any other section of *Orthoceras*.

Not very uncommon in the carboniferous limestone of Lowick, Northumberland.

(*Col.* University of Cambridge.)

BIBLIOGRAPHICAL NOTICES.

A Naturalist's Rambles on the Devonshire Coast. By P. H. Gosse, A.L.S. &c. London: John Van Voorst, 1853.

We shall do our readers a service at this season of the year, when so many are seeking health and relaxation by the sea-shore, by directing their attention to this very pleasing and useful work. Armed with this and Dr. Harvey's excellent 'Sea-side Book*,' every pool will be found to offer ample sources of amusement and instruction, and they may bid defiance to that dire ennui which would appear to be the source of the ordinary melancholy amusements of a 'watering place.' We do not mean to say that people who go for relaxation to the sea-side should bore themselves by taking microscopes and scalpels and making scientific observations; but without going at all deeply into the subject, the search for zoophytes and mollusks will give their walks something of the excitement of a hunt, and bringing them home—watching their odd ways, and finding out all about them in the books—will originate a vast deal of interest, and a great deal of fun and humour into the bargain. At least so we have found it, and we dare not venture to imagine that the 'gentle reader' is a more dry and adust personage than ourself.

Most persons have a gustatory interest in Prawns, and indeed one considers it to be part of one's mission at the sea-side to devour them at breakfast and tea; but how few of us there are who are aware that

* Published by Van Voorst,—a book popular enough to cause a 'Religious' Society to put forth a work with a title so similar, that those who look no further might be readily deceived. We trust our readers will take care to discourage this pious aberration.

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